DOCUMENT RESUME

ED 126 326 CE 007 459

AUTHOR Korn, Thomas A.; Dunn, Dennis J.
TITLE The Task Matrix Procedure.
INSTITUTION Wisconsin Univ.-Stout, Menomonie. Stout Vocational Rehabilitation Inst.
SPONS AGENCY Rehabilitation Services Administration (DHEW), Washington, D.C.
PUB DATE Nov 75
GRANT 16-P-56821/5
NOTE 22p.; Prepared by the Research and Training Center

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Entry Workers; *Matrices; *Occupational Tests; *Task Analysis; *Task Performance; *Test Construction
IDENTIFIERS Dictionary of Occupational Titles; DOT; *Work Sample Tests

ABSTRACT

The paper describes the task matrix procedure for determining the task content for work samples in entry-level occupations within a specified occupational group or industry. The procedure enables the work sample developer to systematically obtain and organize task information from the Dictionary of Occupational Titles in order to identify those tasks to be included in the work sample. The four basic steps in using the task matrix procedures are described in detail: (1) determining the basis for work sample development, (2) locating entry-level occupations, (3) developing the task matrix, and (4) identifying the work sample tasks. Appended materials include a five-item bibliography and a list of entry-level worker trait groups as indicated in the Dictionary of Occupational Titles, Volume 2. (Author/BP)

**********
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
**********

ED126326

U S DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
NATIONAL INSTITUTE OF
EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Interface Number One

# THE TASK MATRIX PROCEDURE

Thomas A. Korn
and
Dennis R. Dunn

November 1975

Research and Training Center
Stout Vocational Rehabilitation Institute
University of Wisconsin-Stout
Menomonie, Wisconsin 54751

CE007459

Final preparation and printing by the Research and Training Center, Stout Vocational Rehabilitation Institute, University of Wisconsin - Stout. Partial support provided through grant No. 16-P-56821/5, from the Rehabilitation Services Administration; Office of Human Development; Department of Health, Education, and Welfare; Washington, D.C. Interpretations shown in this publication do not necessarily represent the interpretations or opinions of DHEW/OHD/RSA.

Oops! We found some mistakes!

Please paste the following errata sheet on the inside cover of Interface Number One; ('The Task Matrix Procedure', Korn & Dunn, November, 1975).

ERRATA

Please note the following corrections:

Page 4, paragraph 3, line 3, should read:

. . . based. This step is dependent upon . . .

Page 5, paragraph 2, line 7, should read:

. . . to determine whether clients typically . . .

Page 6, paragraph 1, line 2, should read:

. . . Divisions and Groups" (D.O.T., . . .

## Foreword

Existing materials on work sample development are primarily geared toward work samples based on a specific job or occupation (e.g., Crouse, 1959, Experimental Manpower Laboratory, 1970; Thomas, 1973). These approaches to work sample development proceed from a job analysis done on a specific job, or several analyses done on jobs which make up an occupation, to the selection and organization of tasks representative of the job or occupation. The latter point tends to be glossed over in most presentations of work sample development, although the Experimental Manpower Laboratory (1970) has developed decision rules which allow the work sample developer to select the most practical tasks to include in the work sample, based on administration time requirements and equipment, tool, or material limitations.

There are three basic limitations of available work sample development methods. First, these methods produce work samples specific to particular jobs or occupations and not to the range of entry occupations found within a particular occupational group or industry. Second, these methods require that the work sample developer conduct a detailed job analysis of the target job; this often demands skills and time which are not available and overlooks the potential use of published job and occupational analysis materials. Third, the selection of tasks to be included in the

final work sample may overlook some tasks which are actually most representative of the occupation, in terms of frequency of occurrence or performance.

Work samples which relate to a number of entry-level occupations within a particular occupational group or industry, as opposed to single job or occupation work samples, could be very useful tools for vocational evaluators. These work samples would allow individuals who have not had any substantial prior experience with the occupational group or industry to gain information about the types of tasks typically performed and to explore their interests and capacities in relation to these tasks. At the same time, vocational evaluators would be provided with the opportunity to observe individuals performing tasks representative of those performed in entry-level positions, thereby gaining information which is useful in subsequent vocational counseling.

The purpose of this paper is to describe the task matrix procedure for determining the task content for work samples. This procedure enables work sample developers to overcome the limitations inherent in existing techniques. Specifically, the task matrix procedure: (1) allows work sample developers to produce work samples representative of several entry occupations in an occupational group or industry; (2) makes use of published occupational analysis information contained in the Dictionary of Occupational Titles (U.S. Department of Labor, 1965); and (3) allows work sample

developers to select the content of work samples based upon the frequency of occurrence of tasks in entry-level occupations.

## Task Matrix Procedure

The task matrix procedure is a systematic method for developing work samples which include the most common or most frequently performed worker tasks and functions in entry-level occupations within a specified occupational group or industry. The procedure enables the work sample developer to systematically obtain and organize task information from the Dictionary of Occupational Titles (U.S. Department of Labor, 1965) to identify those tasks to be included in the work sample. The procedure assumes that the work sample developer is familiar with and has access to the D.O.T., but beyond this, little is required.

There are four basic steps in using the task matrix procedure: (1) determining the basis for work sample development; (2) locating entry-level occupations; (3) developing the task matrix; and (4) identifying the work sample tasks. In the remainder of this paper, we will describe each of these steps in more detail.

Determining the basis for work sample development.

The first step in the task matrix procedure is to determine whether the work sample will be occupationally- or industrially-based. This step is dependent upon the work sample developer's knowledge of the way evaluees typically describe their vocational goals and interests. These descriptive statements may be occupationally-based or industrially-based. If evaluees typically

describe their goals and interests in terms such as "I want to be a beautician" or "I'm interested in sales," their underlying conception of the world of work is occupationally-based. On the other hand, statements such as "I want a job in the paper mill" or "I'm interested in construction" suggest that their underlying conception is industrially-based. The way in which evaluees typically conceptualize and state their interests and goals may vary depending upon the location of the evaluation program and the target group served. For example, it is not unusual to find that evaluees from rural areas typically describe their vocational goals and interests in terms of local industries, even to the extent of identifying specific company names.

A record of evaluee vocational goal and interest statements can be a valuable resource to the work sample developer. This record can be reviewed in relation to existing work samples to identify frequently mentioned occupations which are not included and for which work samples should be developed. Additionally, an accurate record of statements enables the work sample developer to determine whether evidences typically conceptualize their goals and interests in terms of occupations or industries.

The classification of goal and interest statements into the occupational or industrial categories is verified using Volume II of the Dictionary of Occupational Titles. Occupational classifications can be verified by looking up the evaluee goal or interest

statement in the listing "Alphabetic Arrangement: Occupational Dimensions and Groups" (D.O.T., Vol. II, p. 25-32). This search should locate the Occupational Group Arrangement (OGA) and related three-digit code associated with the goal and interest statements.

Industrial classifications can be verified by locating the goal and interest statements in the "Industry Index" (D.O.T., Vol. II, p. 637-639). This will identify the page number on which the description of the industry and listing of the job titles typically found in the industry is located.

The importance of this step in developing a work sample should not be downgraded. It insures that the work sample to be developed is within the conceptual frame of reference of most of the persons who will be exposed to it. Secondly, it identifies which sources of detailed information relating to the tasks typically performed on the job will be used in the second step.

Locating entry-level occupations.

The second step in developing a task matrix is to locate the entry-level occupations within either the Occupational Group Arrangement (OGA) or industry identified in the first step. For our purposes, entry-level occupations can be defined as those which do not typically require previous work experience and/or specialized post high school training for entry. These occupations may, however, sometimes require that applicants have a high school diploma and/or some specialized coursework at the high school level. These requirements do not generally pose any significant

barrier to job entry and may be met through post-evalution services.

Entry-level occupations for an occupationally-based work sample are readily identified using Supplement I to the Dictionary of Occupational Titles: Selected Characteristics of Occupations (U.S. Dept. of Labor, 1966). This supplement lists all of the occupations in the D.O.T. in order by code number. The entry occupations for any OGA can be identified by reviewing the Worker Trait Group codes (the final three digits of the full code) to locate those with the highest number. There are some occupational groups for which the entry occupations require training and experience in excess of what we are considering as an entry-level occupation. This can be determined by reviewing the description of "Training and Methods of Entry" for the worker Trait Group in Volume II of the D.O.T. Once the entry-level occupations have been identified, their titles should be listed. This may occasionally produce what appears to be an excessive number of occupations within certain OGA's. If necessary, the number of occupations to be considered can be reduced by either (1) selecting only occupations from industries present in the local area or (2) selecting only occupations described as "any industry." Since industrial designations are provided for each title in Supplement I, this selection can be readily made by the work sample developer.

Locating entry-level occupations for an industry is more time consuming and requires that Volume I of the D.O.T. be consulted. Each of the job titles listed within the industry in the "Industry Arrangement of Titles" (D.O.T., Vol. II, pp. 531-635) must be looked up in Volume I to determine its code number. Those occupations with the highest last three digits (designating the Worker Trait Group) are then checked against the descriptions for "Training and Methods of Entry" in the Worker Trait Group descriptions in Volume II of the D.O.T. This enables the work sample developer to identify the entry-level jobs for an industry.

At the end of this step, the work sample developer has a listing of the entry-level occupations within the target occupational group or industry. This list is used in the next step.

Developing the task matrix.

Once the entry-level occupations have been identified, the task matrix can be developed. This step uses the task descriptions for each of the entry-level occupations as reported in Volume I of the D.O.T.

To begin development of the task matrix, the work sample developer would look up the descriptions of each occupation in Volume I. Development of the task matrix is facilitated if the task descriptions of each occupation are recorded on an individual 5 x 8 card. A separate line should be used for each task statement in the description, and the method verb (i.e., the verb telling

how the worker does each task) set off from the remainder of the description.

After all of the task descriptions have been recorded from Volume I, the task matrix can be completed. A sample matrix is shown in Table 1, where tasks (method verbs and processes) are listed down the rows and occupational titles across the columns. An important consideration in the development of the matrix is to group together tasks from the different entry-level occupations on the basis of similarity methods or functions used to perform them. This grouping is in part dependent upon the work sample developer's ability to recognize similar methods and processes in different descriptions of tasks; i.e., recognizing that "posts items issued on records" and "records identification numbers on stock cards" involve essentially the same processes and could be more generally described as "records data on record forms".

The identification of similar worker functions is simplified if the task statements are on 5 x 8 cards as suggested earlier. These are reviewed to identify the occupation which has the greatest number of tasks, and the tasks are then listed on the task matrix form. Individual tasks for each of the other entry occupations are then reviewed to determine their similarity to the tasks already listed in the matrix. If the task is similar to one already in

Table 1

Task Matrix for Entry-level Occupations

Occupational Group: Stock Clerking DOT Code: 223.887

| TASK STATEMENTS (method verbs and immediate objects) | OCCUPATIONS | | | | | | | | | Task Frequencies |
|---|---|---|---|---|---|---|---|---|---|---|
| | Central Supply Worker | Pattern Keeper | Stock Supplier | Medical Supply Clerk | Cotton Sampler | Decal Cutter | Cloth Bin Packer | Odd Piece Checker | | |
| Scrubs and washes articles | X | X | | X | | | | | | 3 |
| Sterilizes articles | X | | | | | | | | | 1 |
| Prepares packages of articles using designated lists | X | | X | X | | | X | X | | 5 |
| Wraps packages | X | | | X | X | | | | | 3 |
| Labels packages | X | | | | X | | | | | 2 |
| Seals packages | X | | | | | | | | | 1 |
| Sharpens needles | X | | | | | | | | | 1 |
| Matches articles by size, name or number | X | | X | | | | | | | 2 |
| Examines articles for defects | X | X | X | | | | | | | 3 |
| Patches holes in articles | X | | | | | | | | | 1 |
| Stores articles in designated area | X | X | | X | | X | | | | 4 |
| Opens/unpacks packages | | X | | | X | | | | | 2 |
| Determines locations using rule and pattern sample | | X | | | | | | | | 1 |
| Rivets ID plates on rollers | | X | | | | | | | | 1 |
| Gathers and/or delivers materials | | X | X | X | | X | | X | | 5 |
| Records data on record forms | | X | X | | | | X | | | 3 |
| Observes work stations | | | X | | | | | | | 1 |
| Keeps files | | | X | | | | | | | 1 |
| Pulls/cuts samples from packages | | | | | X | | | | | 1 |
| Cuts sheets along indicated lines | | | | | | X | | | | 1 |
| Piles cut decals | | | | | | X | | | | 1 |

the matrix, an "x" is recorded under the job title to indicate that the task is dissimilar, it is listed in the "task statements" column. The work sample developer continues this process until all of the tasks are recorded.

At the end of this step, the work sample developer should have a completed task matrix similar to that shown in Table 1 for stock clerking (OGA 223). The matrix identifies all of the tasks performed by entry-level workers in the occupation or industry, as well as the specific occupations in which these tasks are performed.

Identifying work sample tasks.

The next step is to identify the most common tasks performed by entry-level workers. This is easily done by determining the frequency of occurrence for each of the tasks and selecting those which occur most frequently for the work sample. It can be seen from the example in Table 1 that the most frequently occurring tasks in stock clerking are:

Gathers and/or delivers materials
Examines articles for defects
Scrubs and washes articles
Prepares packages of articles using designated lists
Wraps packages
Stores articles in designated area
Records data on record forms

The most frequently performed tasks summarize the basic tasks done by workers in stock clerking and can be rearranged to describe a smooth sequence of tasks to be performed in the work sample,

as was done here. Using this information the work sample developer can go on to develop a sample in which an evaluee must perform each of these tasks, with the assurances that the evaluee will be exposed to the most common tasks performed in the occupation and that the evaluator will have an opportunity to observe evaluee performance on them.

## Discussion

The task matrix procedure for work sample development has a number of advantages to it. First, it insures that the work samples which are developed are structured around either the occupationally- or industrially-based frame of reference typical of most persons served in an evaluation program. Second, it enables the work sample developer to make optional use of the information contained in the DOT. Third, it allows the work sample developer to identify the task content of a work sample on the basis of the most common or most frequently performed tasks in a group of related entry-level occupations. Fourth, the procedure insures that the resulting work sample has a high degree of face and content validity. In summary, the task matrix procedure is an economical and straightforward approach to work sample development.

References

Crouse, P. The development of work sampling at the Morrison Center. In May T. Morrison Center for Rehabilitation, Institute on work evaluation. San Francisco, Author, 1959.

Experimental Manpower Laboratory. The work sample: Reality-based assessment of vocational potential. New York: Mobilization for Youth, 1970.

Thomas, S. Suggested format and content of a work sample manual. Menomonie, Wisconsin: Materials Development Center, 1973.

U.S. Department of Labor. Dictionary of Occupational Titles (3rd. Ed.) Washington, D.C.: U.S. Government Printing Office 1965.

U.S. Department of Labor. Selected characteristics of occupations: A supplement to the dictionary of occupational titles - third edition. Washington, D.C.: U.S. Government Printing Office, 1966.

APPENDIX I

ENTRY LEVEL WORKER TRAIT GROUPS

The following list presents entry level Worker Trait Groups as indicated in the Dictionary of Occupational Titles, Vol. II. "Entry level" was operationally defined as not requiring previous work experience or an apprenticeship for entry. However, it should be noted that some of the Worker Trait Groups listed do typically require either a high school diploma in a business or vocational program or specialized high school coursework for entry.

| DPT Code | Worker Trait Group Title | DOT, Vol. II. Page # |
|---|---|---|
| .251 | Sales and Service Work | 486 |
| .268 | Investigating, Protecting, and Related Work | 416 |
| .268 | Miscellaneous Amusement and Recreation Work | 404 |
| .281 | Drafting and Related Work | 377 |
| .282 | Motion Picture Projecting, Photographic Machine Work, and Related Activities | 514 |
| .288 | Surveying, Prospecting, and Related Work | 385 |
| .358 | Demonstration and Sales Work | 488 |
| .363 | Transportation Service Work | 519 |
| .364 | Transportation Service Work | 519 |
| .368 | Information Gathering, Dispensing, Verifying, and Related Work | 258 |
| .368 | Miscellaneous Amusement and Recreation Work | 404 |
| .368 | Paying and Receiving (Banks and Other Establishments) | 267 |
| .381 | Artistic Restoration, Decoration, and Related Work | 234 |
| .382 | Motion Picture Projecting, Photographic Machine Work, and Related Activities | 514 |
| .383 | Delivery and Service Work, n.e.c. | 491 |

| DPT Code | Worker Trait Group Title | DOT, Vol. II. Page # |
|---|---|---|
| .388 | Classifying, Filing, and Related Work | 276 |
| .388 | Computing and Related Recording | 280 |
| .388 | Stenographic and Related Work | 278 |
| .458 | Demonstration and Sales Work | 489 |
| .463 | Transportation Service Work | 519 |
| .468 | Cashiering (Drug Store, Theaters, Restaurants, and Related Establishments) | 269 |
| .468 | Customer Service Work, n.e.c. | 501 |
| .468 | Miscellaneous Amusement and Recreation Work | 404 |
| .478 | Customer Service Work, n.e.c. | 501 |
| .483 | Delivery and Service Work, n.e.c. | 491 |
| .484 | Sorting, Inspecting, Measuring, and Related Work | 282 |
| .485 | Sorting, Inspecting, Measuring, and Related Work | 282 |
| .487 | Sorting, Inspecting, Measuring, and Related Work | 282 |
| .488 | Computing and Related Recording | 280 |
| .582 | Typesetting, Reproducing, and Related Machine Work | 274 |
| .584 | Sorting, Inspecting, Measuring, and Related Work | 282 |
| .585 | Sorting, Inspecting, Measuring, and Related Work | 282 |
| .587 | Sorting, Inspecting, Measuring, and Related Work | 282 |
| .588 | Routine Checking and Recording | 289 |
| .588 | Typing and Related Recording | 287 |
| .683 | Sorting, Inspecting, Measuring, and Related Work | 282 |

| DPT Code | Worker Trait Group Title | DOT, Vol. II. Page # |
|---|---|---|
| .684 | Sorting, Inspecting, Measuring, and Related Work | 282 |
| .685 | Sorting, Inspecting, Measuring, and Related Work | 282 |
| .687 | Sorting, Inspecting, Measuring, and Related Work | 282 |
| .688 | Routine Checking and Recording | 289 |
| .848 | Specialty Entertainment Work | 406 |
| .858 | Selling and Related Work | 493 |
| .862 | Switchboard Service | 291 |
| .863 | Miscellaneous Customer Service Work | 503 |
| .864 | Miscellaneous Customer Service Work | 503 |
| .865 | Miscellaneous Customer Service Work | 503 |
| .867 | Miscellaneous Customer Service Work | 503 |
| .868 | Accommodating Work | 505 |
| .868 | Miscellaneous Personnel Service Work (Food Serving, Portering, Valeting, and Related Activities) | 507 |
| .868 | Signaling and Related Work | 354 |
| .868 | Ushering, Messenger Service, and Related Work | 539 |
| .873 | Miscellaneous Customer Service Work | 503 |
| .874 | Animal Care | 511 |
| .874 | Miscellaneous Customer Service Work | 503 |
| .877 | Animal Care | 511 |
| .877 | Miscellaneous Customer Service Work | 503 |
| .878 | Child and Adult Care | 479 |
| .878 | Miscellaneous Personal Service Work (Food Serving, Portering, Valeting, and Related Activities) | 507 |

| DPT Code | Worker Trait Group Title | DOT, Vol. II. Page # |
|---|---|---|
| .878 | Ushering, Messenger Service, and Related Work | 509 |
| .883 | Driving-Operating | 444 |
| .884 | Manipulating | 322 |
| .885 | Tending | 447 |
| .886 | Feeding-Offbearing | 356 |
| .887 | Handling | 360 |